2-Port Serial Device Server
Model：HK-8102D

User’s manual

Version 1.3

Chapter 1 System introduction

1.1 Summary

HK-8102D two serial orifice equipment net device server (brief name: serial device server) is the independent development networking product of our company about RS-232/485/422 serial orifice terminal equipment. The 5220 D series product adopts 32 processors and combines efficiently embedded system and make equipment run more safe and stable

The 5220 D series serial device server none needs heavy investment to replace or upgrade, it can let the original RS-232/485/422 serial industry control equipment immediately have a network to unite capability with each other, provide efficient, safe, stable data gateway for the serial orifice data information. The 5220 D series product was applied to communication and control realm extensively, such as electric power supervision, engine room supervision, PLC, intelligence electric meter, gas meter and biological recognition device and reader...etc., it is the connectivity bridge between serial orifice equipment and TCP/IP Ether network.

1.2 Function

◆Auto-detecting 10/100 Mbps Ethernet

◆Built-in 15 KV ESD protection for all serial signals.

◆Supports various operation mode: COM port redirectior (Virtual COM port).

◆Versatile socket operation modes: TCP Server, TCP Client, UDP, and Ethernet Modem

◆Supports multi-access features: allows maximum of six hosts to access one serial port simultaneously

◆Pair Connection mode for connecting two serial devices over a network without a PC

◆Supports DNS（TCP Client Only）

◆Supports SNMP MIB-II for network management

◆Configuration via web/Telnet/serial console

◆Support to auto recovery after power and network break

◆Support to monitor the status。It can monitor the each orifice receives and dispatches through the website

◆The network of the enhancement installs setup and IP/MAC to filter rule and assure your arrangement and network stability。

◆Provide a convenient firmware to upgrade, assure to continuously promote product performance and reliability

1.3 Specifications

LAN

Ethernet: 10/100 Mbps auto sensing

No. of Ports: 1

Port Connector: RJ45

Protection: Built-in 1.5 KV magnetic isolation

Serial Interface

Interface：2-port RS-232/422/485(software selectable)

Port Type：Male DB9

RS-232 Signals：TXD, RXD, RTS, CTS, DTR, DSR, DCD, GND

RS-422 Signals：TX+, TX-, RX+, RX-, GND

RS-485 Signals：RS485+, RS485-, GND

Protection: 400W TVS protection

Serial Communication Parameters:

Parity：None, Even, Odd

Data Bits：5, 6, 7, 8，9

Stop Bit：1, 1.5, 2

Flow Control：RTS/CTS, DSR/DTR, Xon/Xoff

Transmission Speed：110~460.8Kbps

Software Features

Protocols：ICMP, IP, TCP, UDP, DHCP, Telnet, SNMP, HTTP

Utilities：Supports Windows 2000/XP/2003/Vista

OS Drivers Support：Real COM drivers for: Windows

Windows 2000/XP/2003

Configurations：Web interface, Windows utility, Telnet console

Power Requirements

Power Input：9-40V DC

Power Consumption：<1.5W

Mechanical

Material：Aluminum case (1 mm)

Dimensions： 110*74*24mm（L*W*H）

Environment

Operation Temperature：-10-60˚C

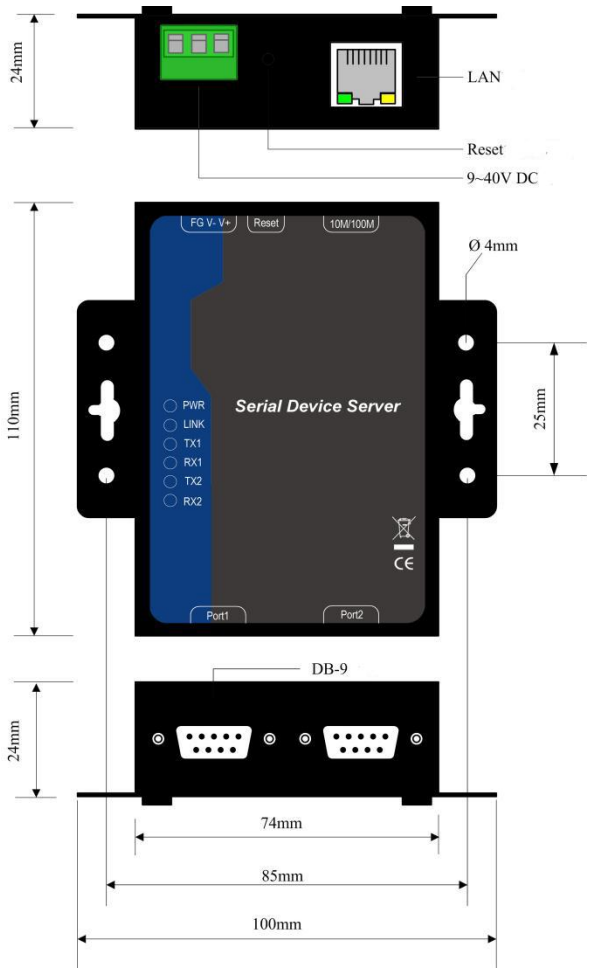
Storage Temperature：-20-85˚C (-4-185˚F)

Operating Humidity：5-95%RH

Warranty：2 years

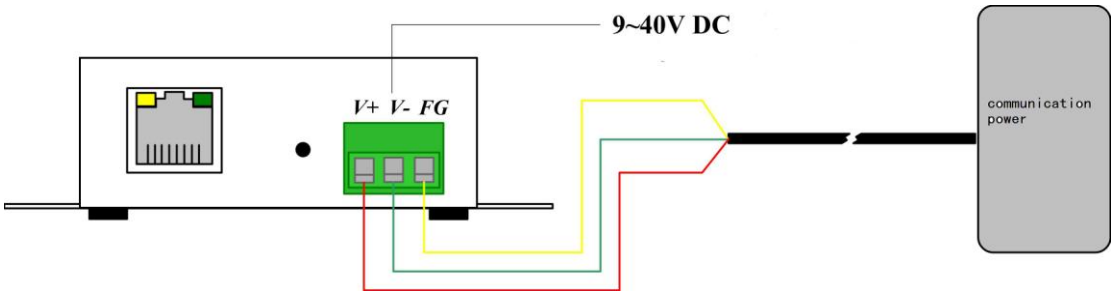
Chapter 2 hardware installation

2.1 equipment structure



2.2 Equipment installation

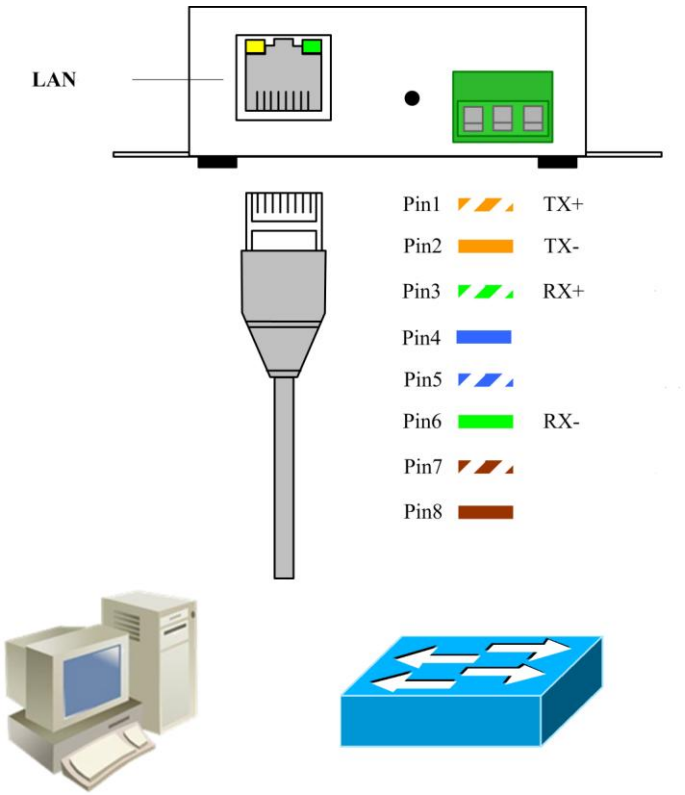
2.2.1 Connect power



HK-8102D serial device server product provide 9~40V DC power input, it can direct connect the direct current of communication power and corresponding power pins. For example, if the power of client is +12V, please connect +12V and V+, GND and V-, Safeguard earth or shield earth to link FG

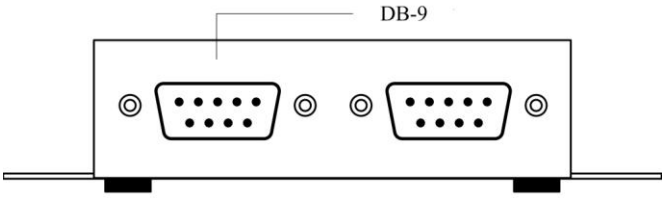
If client use the high voltage, please purchase the product which support the 9~60V DC power input

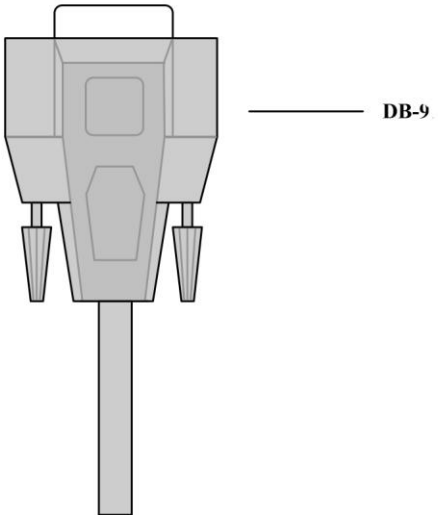
2.2.2 Connect network



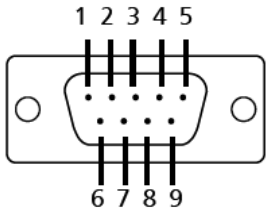
HK-8102D serial device server product provide normal Ether net port, support MDI/MDI-X, It can link parallel wire and exchange equipment, such as exchange machine, and HUB etc.. or link secant wire and terminal equipment, such as Router and PC etc..

2.2.3 Connect serial orifice equipment





HK-8102D serial device server provide DB9 pin connecting orifice, support RS-232 (DTE) serial communication, it can choose RS-485/422 connecting orifice (HK-8102D-A). DB9 pin connecting orifice are defined as below:



DB9-M	RS-232	RS-422/485(4W)	RS-485(2W)
1	DCD (in)	TXD-	
2	RXD (in)	TXD+	
3	TXD(out)	RXD+	Data+
4	DTR (out)	RXD-	Data-
5	GND	GND	GND
6	DSR (in)	---	---
7	RTS (out)	---	---
8	CTS (in)	---	---
9	---	---	---

2.2.4 Indicator instruction

HK-8102D serial device server product provide 6 status indicators, the indicators are defined as below:

Indicator	instruction	color	status
PWR	Power input status	red	Normally on：system power is connected
			Normally off：equipment don't connect direct current
LINK	Ethernet connecting instruction	green	Normally on：Ethernet connecting orifice and net are connected normally
			Normally off：Ethernet connecting orifice and net don't connected
TX1-TX2	Serial data sending instruction	green	twinkle：serial interface is sending data
			Normally off：serial interface don't send data
RX1-RX2	Serial interface data receival instruction	yellow	twinkle：serial interface is reciving data
			Normally off：serial interface don't receive data

2.2.5 Equipment start-up and Reset switch operation

HK-8102D provide Reset switch, it can be used to recover plant setup manually without enter HK-8102D

Power start-up step on the equipment

Connect DC IN interface and 9~40V DV power plug, PWR red LED is bright, Ethernet LINK LED is bright, then break, after about 10 seconds(under normal start-up), TX/RX serial interface LED are twinkle 3 times, the system have finished initializtion process

Note; if you want to start quickly, you can set to high speed start-up

Reset operation step:

① press Reset key

② connect the HK-8102D power, PWR red LED is bright

③ Wait for about 10 seconds, TX/RX LED is twinkle frequently, it mean the parameter recovered to plant setup, then break and reconnect

Chapter 3 Manager method

3.1 Equipment manager method

HK-8102D series serial device server can used Web browser, Telnet and Console to collocate and maintain, it can choose corresponding manager style according to the status

3.1.1 Web browser management

Confirm to HK-8102D serial device server and net are connect normally and keep it in the same net range with the computer what equipment you want to enter, if you don't know the equipment IP, you can used Console control plate and dummy serial software to search the equipment IP. Enter HK-8102D IP to the Web browser then the enter interface occur as below:

HK-8102D default IP: 192.168.0.200, enter default user name: admin, and password: admin, then enter into collocation interface as picture:

Enter collocation interface, user can modify the IP according to the net status

3.2 Equipment parameter setup

3.2.1 Equipment collocation

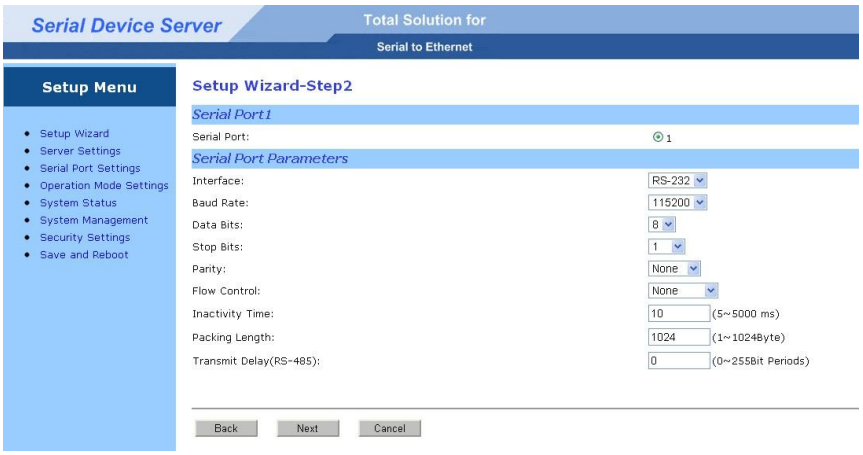
- Quick setup

HK-8102D provide quick setup function, user can use the function to setup the serial device server step by step, the operation is very easy despite you never used the serial device server product, use the function can collocate HK-8102D easy

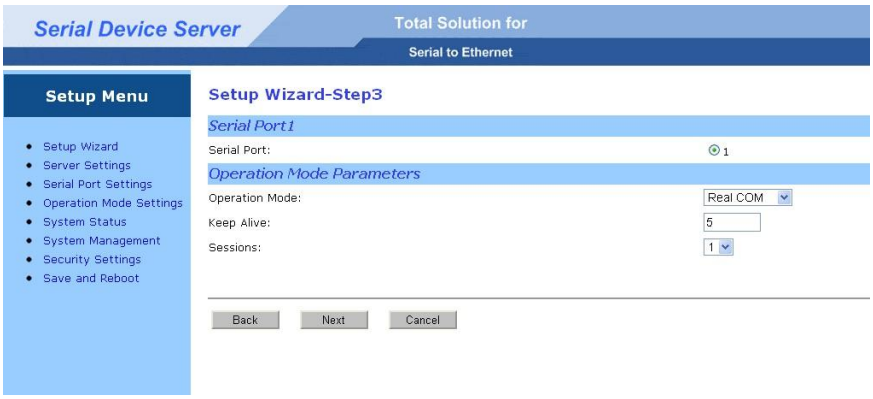
Quick setup function divide into 4 steps:

Step 1: setup the IP, subnet mask, gateway and DNS server etc..

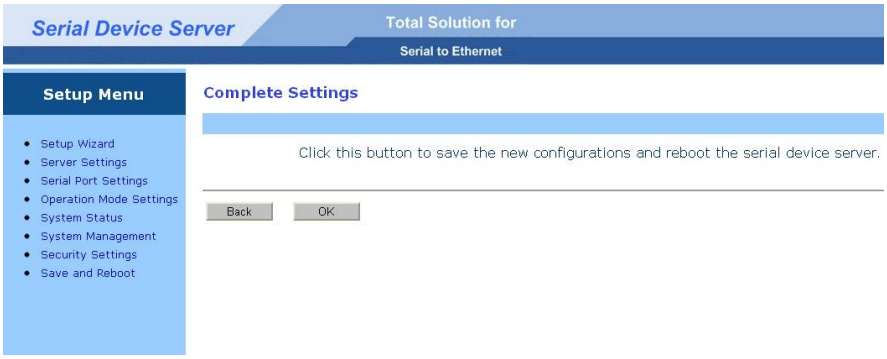
Step 2: setup the serial interface working style and speed etc..



Step 3: setup application mode, the system default mode is Real COM



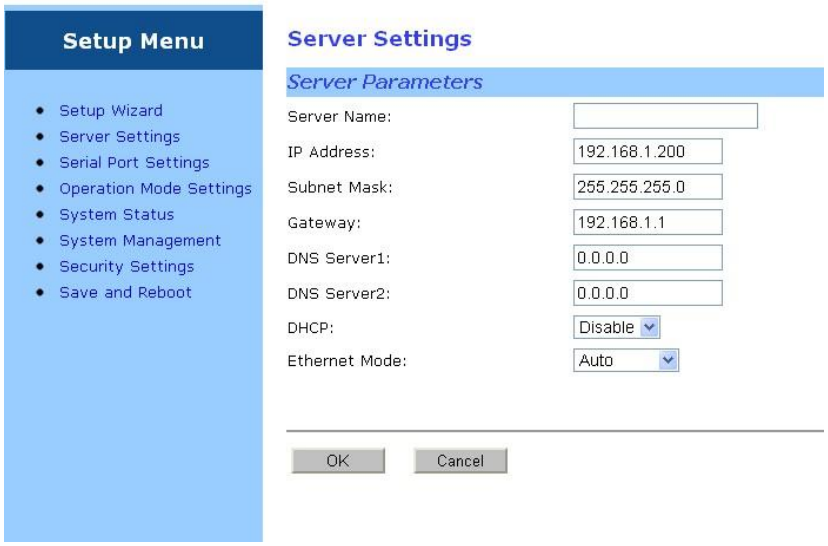
Step 4: save/restart, save and release the parameter user collocated



After the 4 steps setup, serial device server can work normally, you just need install the driver on the terminal such as computer, then it can communicate with the HK-8102D serial interface through the net

➢ Server setup

You can collocate the HK-8102D equipment net parameter in the serial device server interface, they are included equipment name, IP, subnet mask, gateway, DNS server1, DNS server2, DHCP and Ethernet work mode:



Auto is the default mode of Ethernet, user can set to 100M full/half and 10M full/half

If user need to use the HK-8102D to access internet domain name, fill the main and secondary IP into the DNS server 1 and DNS server 2 are necessary, so that can use the domain name server to explain the IP which domain name you want to access.

- Serial interface setup

Serial interface include :

Serial interface style:232/485/422

Baudrate: 110`460800bps

numeric bit data: 5~9

Stop position: 1、1.5、2

Parity check: None、Odd、Even

Flow control: None、CTS/RTS、DSR/DTR、Xon/Xoff

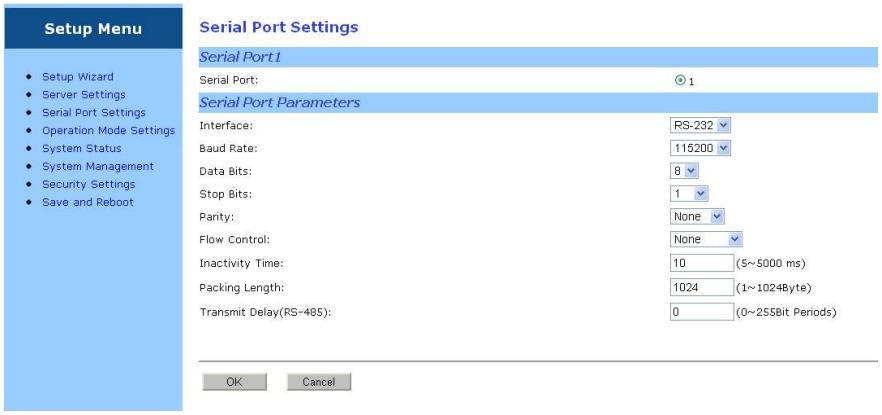
Received free time: 5~5000 MSEL

The received free time is exceed the value when HK-8102D serial interface received the data, it can enclose the data , then transmit. The system default value is 10 ms, you can set the time under 10 ms if you want to increase the transmission, this need to according the actual status to set up.

Received free byte: 1~1024 byte

HK-8102D will transmit the data packet immediately when the received data reach to value you set, the system default value is 1024 byte.

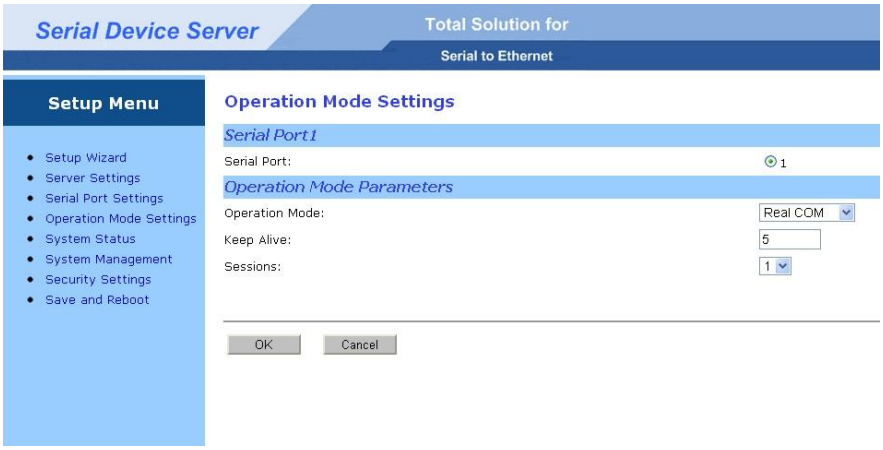
Serial interface setup as the picture:



➢ Operation mode

- Real COM

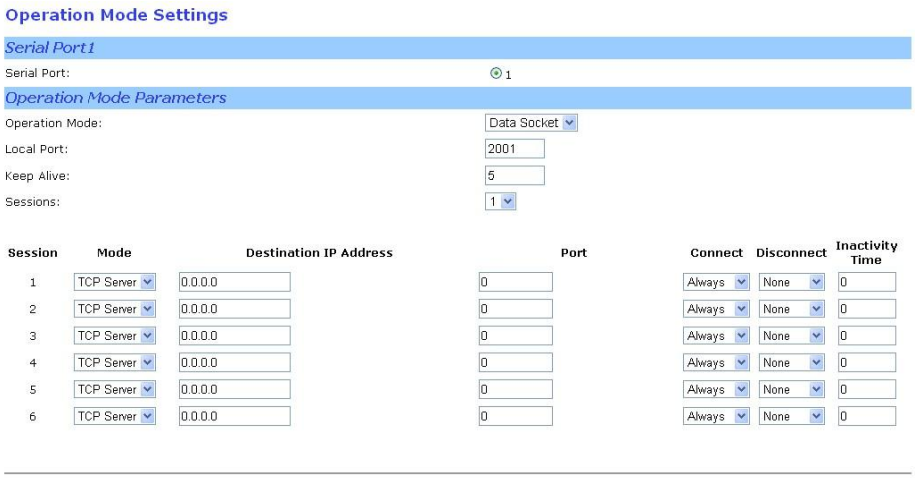
The each serial interface of the serial device server can reflect the serial interface of HK-8102D to fictitious serial interface local machine through the driver(Windows Virtual COM/Linux TTY）. Real COM collocate as picture:



- Data Socket

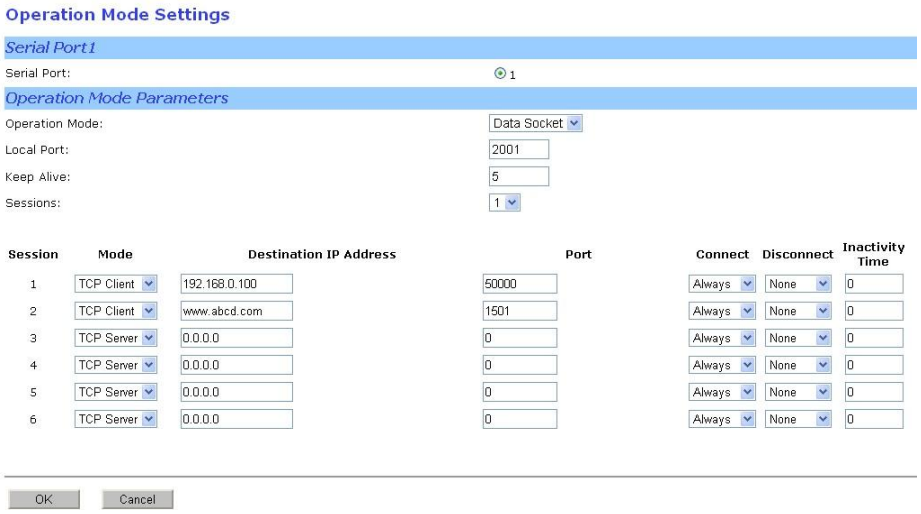
HK-8102D serial device server provide normal Socket API net interface, user can used the Socket under operating system which support TCP/IP to access to HK-8102D server interface. TCP/UDP socket mode divide into TCP Client, TCP server and UDP as TCP client, TCP server and UDP style

When two 5220 product is used in pairs, you can collocate two equipment for TCP Clint and TCP Server mode or UDP mode, The two side of 5220 product connect RS-232/422/485 business interface, the applied mode like this can connect two nonsynchronous terminal equipment through the IP transmission network.



1. TCP Client

When HK-8102D product work on the TCP Client mode, it can connect the TCP terminal interface of network actively such as PC server and distant HK-8102D (TCP Server style) etc.. So need to tell HK-8102D which net address and TCP terminal interface should be connected through corresponding setup. When have connected TCP, HK-8102D will send out the data from the serial interface through Socket and send the data from the Socket to serial interface at the same time. TCP Clint style as picture:



Opposite machine: the IP address of distant terminal TCP Server

Opposite machine support domain name access, after fill in corresponding domain name,HK-8102D will automatically analyze an IP address, and start customer port connectivity

Opposite interface: TCP interface number of distant TCP Server machine

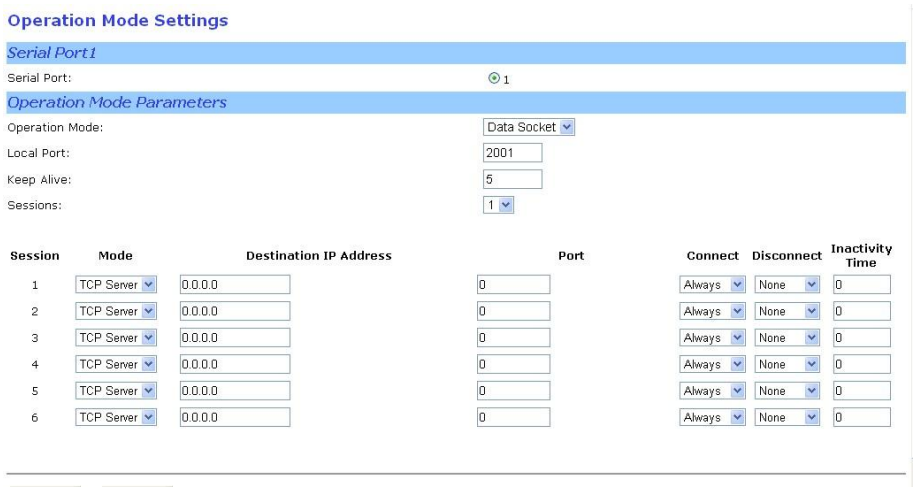
Starting connection: starting connection condition

disconnection: disconnection condition

Free time: if there aren't any data transmission during the setup times, then disconnection automatically, unit: second. Default value is 0 mean there isn't any data transmission but never disconnection

2．TCP Server

When HK-8102D serial device server work on the TCP Server mode, its local TCP interface is on interception and wait for other terminal machine or distant HK-8102D which work on the TCP Clint mode to connect the local interface, serial device server will receive and send data through the Socket after connect each other, The mode mainly used for the network environment of 5220 D passive connectivity distant equipment



It need to fill in local interface on the TCP Server mode, opposite machine and interface isn't need to fill in

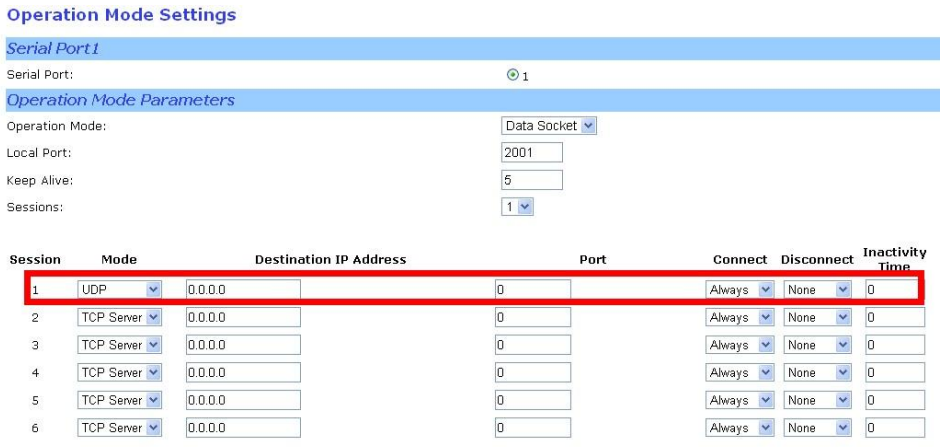
Starting connection: starting connection condition

disconnection: disconnection condition

Free time: if there aren't any data transmission during the setup times, then disconnection automatically, unit: second. Default value is 0 mean there isn't any data transmission but never disconnection

3．UDP

When HK-8102D serial device server work on the UDP mode, it adopt non-connectivity UDP report communication to receive and send data, So the both ends equipment none needs create a connectivity in advance and then can directly carry on point- to-point, point-to-more point or the multicast communication. UDP work mode as picture:



Opposite machine: the IP address of distant UDP machine

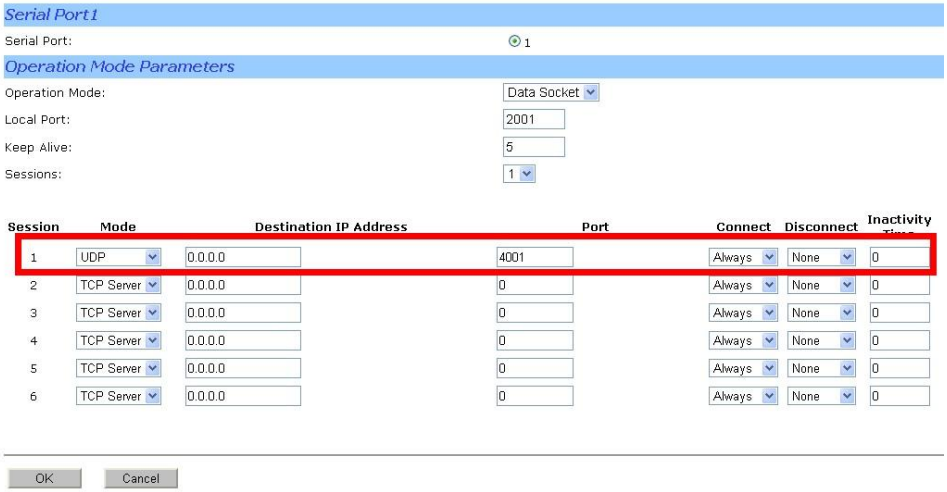
Opposite interface: the interface number of distant UDP machine

Starting connection: starting connection condition

disconnection: disconnection condition

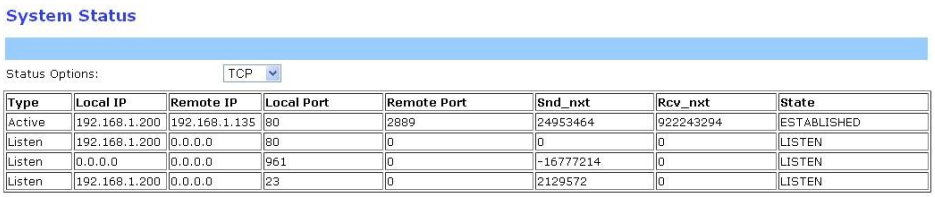
Free time: if there aren't any data transmission during the setup times, then disconnection automatically, unit: second. Default value is 0 mean there isn't any data transmission but never disconnection

Note: if need to pass UDP negotiation and broadcast the serial data and apply point-to-point, you can set opposite IP to 0.0.0.0 (UDP broadcast address), fill the local interface of distant serial device server which need to access in the opposite interface, the distant serial device server need to set as this also. So all the serial device server of net will receive and deal with the UDP data package.



➢ Equipment status

HK-8102D provide the search function of current interface status, user can see the information about connection and data transmission of each interface, it is easy to help user control the running of HK-8102D and analyze the trouble of the net. It can search the TCP status, UDP status and serial interface status in the "equipment status" as picture:



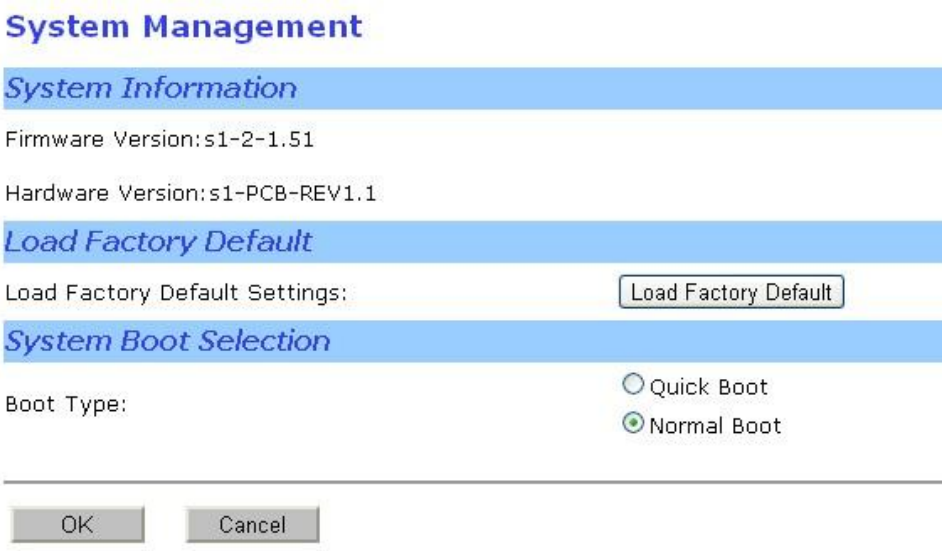
It can see all connection and data transmission of current equipment on the TCP status.

It can see all local and distant IP and interface number which is communicating on the UDP status.

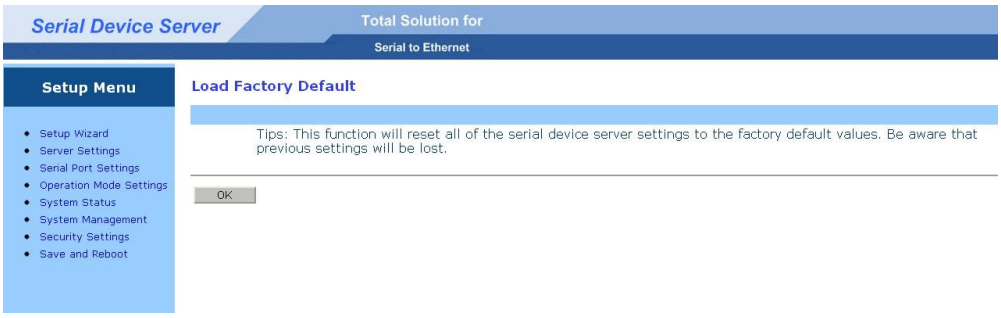
You can see the data transmission on the serial interface status, it can according to the change of these data to estimate whether 5220 can transmit data normally.

- System management

System management provide the software and hardware information of HK-8102D serial device server and recover function as picture:



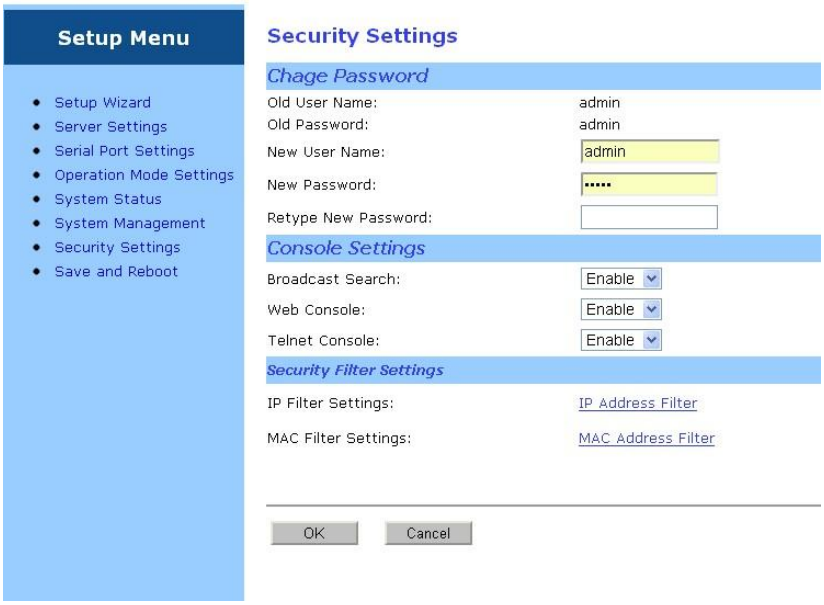
Click “recover original plant default setup” and “YES” according to the note,then the system can be recovered to original plant default setup:



The setup is effective when you save and restart after recover

- Safety setup

HK-8102D serial device server can set password to limit enter equipment and set the IP or MAC address filtration list as picture



Enter password change: user can modify the user name and password.

Equipment original user: admin, password: admin

Access control

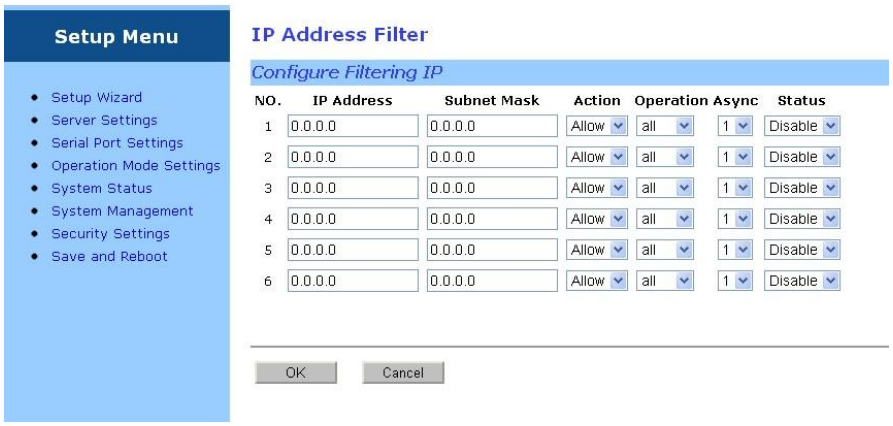
Search equipment: it can search the 5220 serial device server of the net and modify the IP

Web setup: it can permit whether used the Web style to collocate the parameter of the 5220 serial device server.

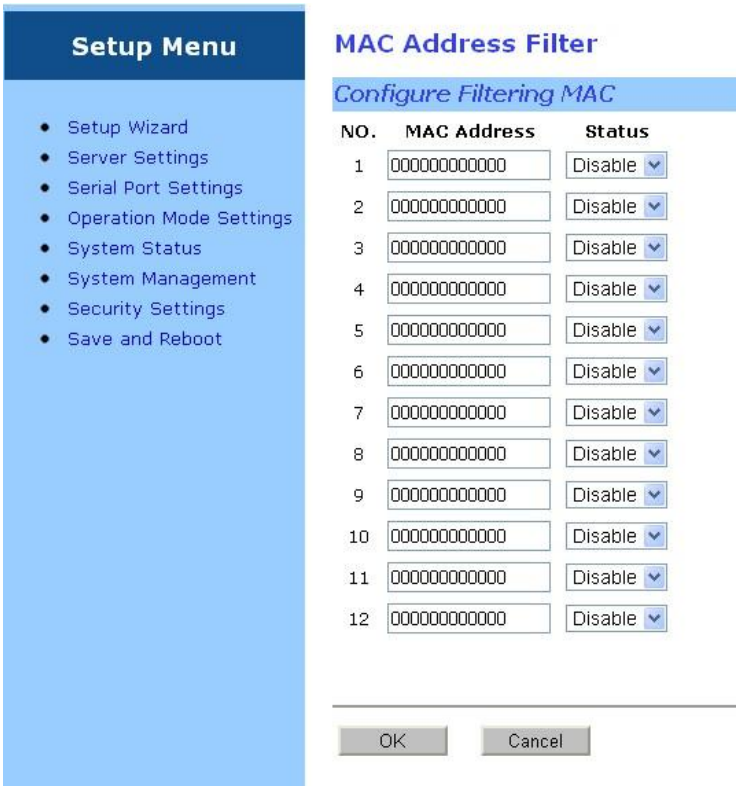
Telnet setup: it can permit whether used Telnet style to collocate the parameter of 5220 serial device server.

Safety filtration setup:

Base on IP filtration: It can used IP setup to control the IP to read and write serial data of HK-8102D.

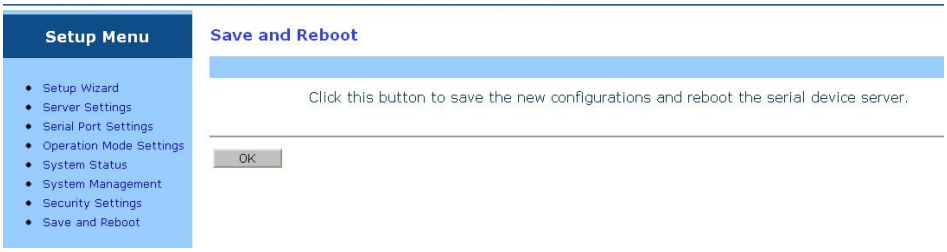


Base on MAC address filtration: it can used MAC address setup to control the IP to read and write serial data of HK-8102D.



- Save/restart

When finished the setup of HK-8102D serial device server, it can save the information of HK-8102D as Flash memorizer through the “save/restart”, then restart equipment and release the information as picture:



Chapter 4 software installation

4.1 software installation

4.1.1 system requirement

Operating system：Windows2000/XP/2003

Hardware requirement：PIII500MHz above、128M memory

4.1.2 software installation

Run the setup of folder as attached CD and install the serial device server program to the system

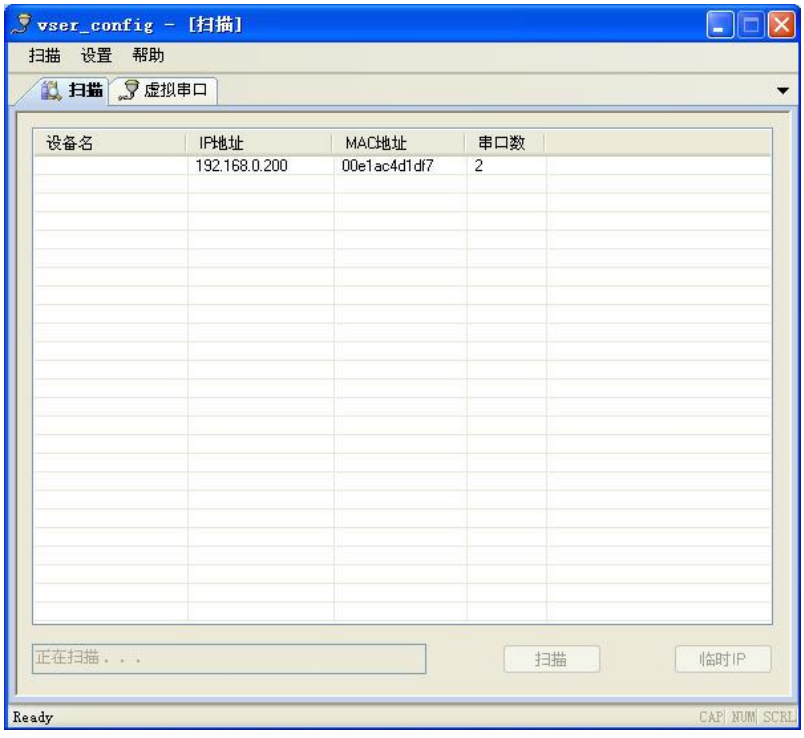
The CD provide PDF document of read software and serial interface test, please see the detail on the CD

4.2 software setup

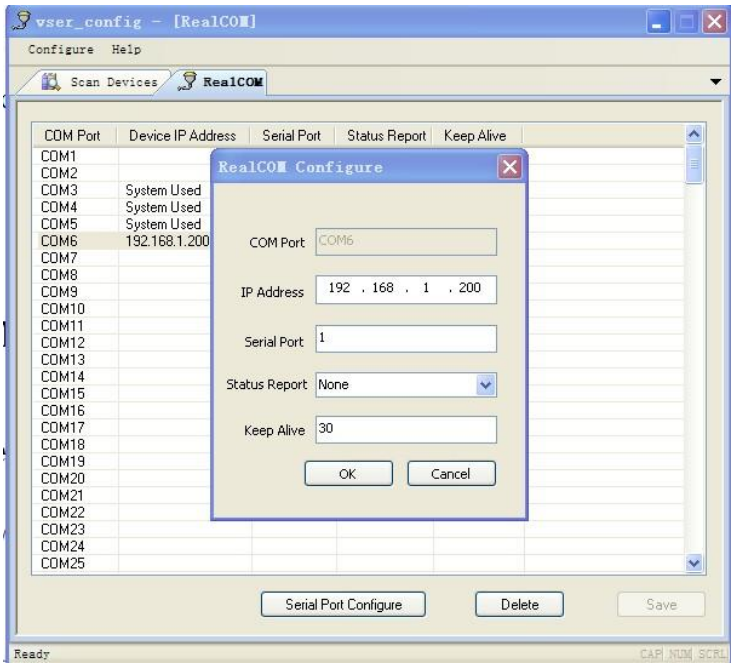
4.2.1 software setup

After finish the serial interface software installation, double click icon on the desktop or run the program from start.

You can search all 5220 serial device server in the net on the “scan” option, then click “temporary IP” to set the IP which equipment was searched, run web browser, fill the IP address to enter web setup interface of 5220



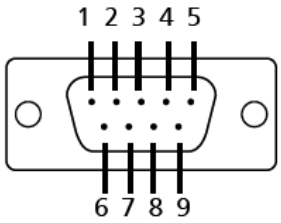
You can reflect HK-8102D to dummy COM interface which be list on the serial interface option, click the setup to fill in IP address and serial number etc.

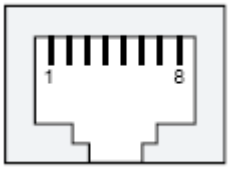


Attachment：

Interface line order

- RS-232/485/422 DB9 Pin (Male) interface line order





RJ45

DB9-M	RS-232	RS-422/485(4W)	RS-485(2W)
1	DCD (in)	TXD-	
2	RXD (in)	TXD+	
3	TXD(out)	RXD+	Data+
4	DTR (out)	RXD-	Data-
5	GND	GND	GND
6	DSR (in)	---	---
7	RTS (out)	---	---
8	CTS (in)	---	---
9	---	---	---

RJ-45	Signal
1	TX+
2	TX-
3	RX+
4	---
5	---
6	RX-
7	---
8	---